Rerefined motor oil:

Overcoming the myths

A RESOURCE MANUAL

DEVELOPED WITH SUPPORT FROM:

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD

GILDEA RESOURCE CENTER
COMMUNITY ENVIRONMENTAL COUNCIL

Rerefined motor oil:

Overcoming the myths

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- the California Department of Transportation, Department of General Services and Integrated Waste Management Board;
- jurisdictions in California that use rerefined oil in their government fleet vehicles, including the Cities of Burbank, Ventura, Santa Monica, Thousand Oaks, Sunnyvale and Alameda County;
- the U.S. Environmental Protection Agency, U.S. Postal Service and Defense Logistics Agency;
- associations such as the American Petroleum Institute, U.S. Conference of Mayors and the National Oil Recycling Association;
- vehicle and engine manufacturers including Ford, Chrysler, General Motors and Detroit Diesel; and
- rerefined base oil and finished product manufacturers, including Safety-Kleen, Evergreen, Unocal, Lyondell and Rosemead.

A number of very good resources are referenced throughout the text and in the back of the manual. These resources are readily available. The purpose of this manual is, however, to facilitate an understanding of rerefined oil without requiring every individual and agency to pursue information separately.

About the project

Rerefined oil program

In 1995 the Community Environmental Council (CEC) received a grant from the California Integrated Waste Management Board (CIWMB) Used Oil Research and Demonstration Program to develop educational materials and conduct workshops on the technology, application, quality and market for rerefined oil. The goals of the project are to overcome quality perception barriers and increase market demand for rerefined oil in California. The project includes a policy and procurement component designed to assist local government with rerefined oil product procurement.

This resource manual is one component of the materials developed for the project; it serves as a companion to an educational video, *Defining Rerefining*. The purpose of the manual is to provide fleet administrators, automotive technicians, purchasing agents and others with information they seek out when evaluating whether to purchase rerefined lubricants. Presented in a clear, concise, easy to use format, the manual includes information on the following:

- ✔ Rerefining technology
- ✔ Product testing, standards and certification
- ✔ Pilot evaluation projects
- ✔ Local and state government agency users
- ✔ Rerefined oil distributors
- ✔ Vehicle manufacturer warranties
- ✔ Procurement mandates and guidelines
- ✔ Sample contract bid specifications

For more information about the project and to schedule a workshop, please contact:

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Community Environmental Council

CEC is a 501(c)(3) community service, research, education and technical assistance organization specializing in integrated solid waste management, land use planning and environmental education. CEC is headquartered at the Gildea Resource Center in Santa Barbara with field offices in Oakland and San Jose. With more than 25 years of experience, CEC provides community services, conducts research and seminars, and provides information and technical assistance to all levels of government, industry and the general public. The organization has extensive experience designing and implementing recycling-based economic development, recycling programs and hazardous waste collection programs.

CEC provides technical assistance in integrated solid waste management systems policy, planning and program development. This work includes evaluating and designing strategies for waste minimization, recycling, composting and community education. CEC assists communities with implementation and administration of waste management and recycling programs, program funding, operations and secondary materials market development.

CEC operates recycling centers, a 30,000 household curbside recycling collection program, and a commercial and multi-family housing recycling program. Through its recycling operations CEC collects, processes and markets thousands of tons of recyclable materials. In conjunction with Santa Barbara County and the University of California, Santa Barbara, CEC operates a state-of the-art collection center for household and small quantity generator business hazardous waste.

In 1995 CEC began its used oil collection, education and promotion programs as well as a rerefined oil training and market development project. Funded by the CIWMB, CEC, in association with the County of Santa Barbara and the City of Santa Barbara, is siting certified used oil collection centers and developing and disseminating educational materials about the proper disposal of used oil. This manual is part of the rerefined oil project which is discussed in greater detail on the previous page.

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INTRODUCTION

Introduction

There are a number of economic, environmental and technical reasons why rerefined oil is slowly gaining a share of the lubricating oil market in the United States. Rerefined lubricating products are often competitively priced, meet demands of environmentally concerned consumers and achieve the same quality standards as new oil manufactured from crude. Federal, state and local governments, the U.S. Postal Service and many private companies are using rerefined lubricants in a range of vehicles - from passenger cars to heavy equipment vehicles.

Rerefining technology has advanced from the days when used oil was reclaimed by removing water, dirt, sludge and some volatile compounds. Used oil that is rerefined undergoes a similar manufacturing process as new oil made from crude. Key components of the rerefining process include vacuum distillation and hydrotreating. In the U.S. and Canada, the Mohawk technology is used by three companies, Mohawk, Safety-Kleen and Evergreen, to produce rerefined base stocks.

Lubricating oils made from rerefined base stocks must undergo the same testing and meet the same standards as those from new base stock in order to receive the American Petroleum Institute's (API) certification mark of approval. Vehicle and engine manufacturers such as Ford, Chrysler, General Motors, Mercedes Benz, and Detroit Diesel have issued warranty statements that allow the use of rerefined oil as long as it meets API standards.

Extensive laboratory and field testing of rerefined oil has been conducted by the National Bureau of Standards, the U.S. Army, the Department of Energy, the U.S. Postal Service and the Environmental Protection Agency. These studies have concluded that rerefined oil is equivalent to virgin oil, that it can pass all prescribed tests and that it occasionally outperforms virgin oil. The chemical composition of rerefined oil and virgin oil are so similar that a chemical analysis lab would conclude that they are identical.[1]

According to the National Recycling Coalition Buy Recycled Business Alliance, if all Americans collected used oil for rerefining, it would keep 35 million cars running smoothly for a year, reduce dependence on foreign oil, provide jobs for Americans and reduce our trade deficit by $150 million.

Fact:

The chemical composition of rerefined oil and virgin oil are so similar that a chemical analysis lab would conclude that they are identical.

The environmental reasons for rerefining used oil begin with the fact that oil is a nonrenewable resource. Rerefining extends the life of a nonrenewable resource by converting it back into a usable product that can be recovered again and again. Since the improper disposal of used oil contributes to soil contamination and surface and ground water pollution, increased demand for rerefined oil can create a greater demand for the proper collection of used oil and diminish irresponsible dumping.

Rerefining is also an energy efficient method of managing used oil. Less energy is required to produce a gallon of rerefined base stock than a gallon of base stock from crude oil. Approximately 100 gallons of crude oil is required to make 9 gallons of neutral base stock. Rerefining 100 gallons of used motor oil recovers almost 65 gallons of rerefined base stock - more than 7 times the amount produced from crude.

Why rerefined oil?

Government officials, fleet administrators and purchasing agents often ask why they should buy rerefined lubricants when they have always purchased virgin oil manufactured from crude. There are a number of economic and environmental reasons why local and state governments should consider purchasing rerefined lubricants. Rerefining, rather than burning or illegally dumping used oil, can:

Fact:
Of the 1.3 billion gallons of used oil generated each year in the U.S., 150 million are salvaged and sold as rerefined oil or blended oils not advertised as rerefined.

- ✔ Preserve nonrenewable resources
- ✔ Reduce environmental impacts from improper disposal of used oil
- ✔ Reduce dependence on foreign oil
- ✔ Create American jobs
- ✔ Provide an alternative market to burning used oil

Because methods to reclaim oil that date back to the 1920s did not produce a high quality product, there are a number of misconceptions that rerefined oil produced today is inferior in quality to virgin based oil. To disprove these misconceptions, outlined on the opposite page as “Myths,” this manual provides information on rerefining technology, testing, standards and certification, local and state government purchasers of rerefined oil, vehicle manufacturer warranties and sample contract bid specifications.

Myths about rerefined oil

Fact:
Rerefined oil is used in making passenger car motor oils, diesel engine oils, hydraulic fluid and other lubricants.

REREFINING TECHNOLOGY

Rerefining technology

Three companies in North America produce rerefined base stocks that, once combined with additives, become a range of lubricating products. These companies, Safety-Kleen in Chicago, IL; Evergreen Holdings, Inc., in Newark, CA; and, Mohawk in Vancouver, British Columbia, Canada, use the same technology to rerefine used oil. Their facilities represent a combined capacity of 5,800 barrels daily. (See page 14.)

The process used to rerefine used oil is very different than methods used to reclaim oil. Reclaimed oil is used oil that has been filtered to remove dirt, fuel, water, and any other heavy particles. Reclaimed oil cannot pass tests to meet API standards or vehicle manufacturer requirements. On the other hand, rerefined oil is used oil that has undergone an extensive process that removes contaminants in addition to water, dirt and fuel. The rerefined oil produced by the three rerefiners in North America does meet API standards. The rerefining process is discussed in greater detail on the following page.

In addition to rerefined base oils manufactured in the U.S. and Canada, rerefined base oils have been imported from Spain, Greece, Korea and other countries.[2] Rerefined base oils are often combined with virgin base oils in the manufacture of a lubricating product. Currently there are a number of brands of rerefined lubricating oils available in the U.S. Some of them include:

- ✔ Safety-Kleen America's Choice
- ✔ Rosemead SOAR
- ✔ Chevron Eco
- ✔ 76 Products Firebird
- ✔ Lyondell Enviroil

The percentage of rerefined oil in the end product varies depending on the manufacturer and the type of lubricating oil. For example, 76 Products and Rosemead market a 15W-40 oil that contains 100 percent rerefined base stock, Safety-Kleen America's Choice 10W-30 and 10W-40 contain 70 to 100 percent rerefined base stock. Other brands contain different percentages of rerefined base stock mixed with virgin base stock. The percent of rerefined base stock can vary depending on the type of product. See the table on page 35 for information on a few of the rerefined lubricating products that are available.

Fact:
Current total rerefining capacity in the U.S. and Canada is 5,800 barrels a day.

Mohawk rerefining process

The Mohawk rerefining process is the only process to date that produces lubricants which meet American Petroleum Institute standards.[3] This process is used by three rerefining companies in the U.S. and Canada. The Mohawk process employs five steps including pre-treatment, distillation of water and light hydrocarbons, distillation of diesel fuel, distillation of asphalt flux and hydrofinishing.

The Mohawk process was designed to accept used oil from a variety of sources. The feedstock usually includes any neutral oil product such as transmission fluid, gear oil, grease, hydraulic oil, metal working oils and motor oils. Used oil is collected from generators (service stations, motor pools, etc.) and tested for hazardous material contamination and other parameters. It is then transported to a rerefinery where it is tested again and pumped into feed tanks.

The first step in the Mohawk process separates water and fuel contaminants from the lube component. Water typically constitutes about 10 percent of the feedstock and fuel (light hydrocarbons) makes up about 3 percent. Diesel fuel is removed in the second distillation stage. The diesel, which makes up about 7 percent of the total feedstock, can be routed back into the plant as fuel or sold to industrial furnaces and boilers.

Fact:

Countries all over the world, including South Africa, Israel, Pakistan, India, Canada, Great Britain, France, Italy and New Zealand rerefine 20 to 60 percent of the available used oil into lubricating base stocks, compared to just 10 percent in the United States.

The third stage separates out the heavy materials which include dirt, metals, additive components and other contaminants. This asphalt flux material is used in roofing shingles, tar paper and asphalt. Free of water, fuel and additives, the lube distillate passes through a thin-film evaporator and then to a hydrotreater.

In the last stage of the Mohawk rerefining process, hydrogen gas and catalysts are mixed with the remaining fraction of waste oil to remove sulfur and other oxidation products. About 65 percent of the original feedstock remains at the end of the process as the finished product base oil. The base oil is split into a light and medium neutral oil. These neutral oils are then ready to be combined with additives to produce products such as transmission fluid, gear oil, grease, hydraulic oil, metal working oils and motor oils.

MOHAWK REREFINING PROCESS

First Distillation Step

- **Water (10% of Feed)** → Treated and sent to waste water treatment facility
- **Light Hydrocarbons (3% of Feed)** → Used at plant as fuel

Second Distillation Step

- **Diesel (7% of Feed)** → Used at plant as fuel
- **Diesel (7% of Feed)** → Sold as fuel

Thin-Film Evaporator

- **Asphalt Flux (15% of Feed)** → Sold for roofing or paving

Hydrofinishing Process

- **Catalyst** → Disposed off-site

Base Oil (65% of Feed)

- Light Base Oil (100 Neutral)
- Heavy Base Oil (300 Neutral)
- Diesel

WASTE OIL FEED

74% Commercially Generated Automobile Oil

14% Do-It-Yourself Automobile Oil

12% Agricultural, Governmental, Industrial Oil

1996 LUBRICATING OIL CAPACITIES
U.S. and Canada rerefiners

(Thousands of barrels daily)

1. Safety-Kleen	
East Chicago, Illinois	3,300
Breslau, Ontario, Canada	1,300
2. Evergreen	
Newark, California	800
3. Mohawk	
Vancouver, BC, Canada	400
Total Capacity	**5,800**

Source: National Petroleum Refiners Association

TESTING, STANDARDS AND CERTIFICATION

Lubricating oil standards

Rerefined lubricants must undergo testing and meet specific standards if they are to be marketed with the American Petroleum Institute certification marks - the donut and starburst symbols. This section describes what the standards are, why they were developed and how they can be used to ensure that the rerefined oil purchased by a local or state government will perform as well as any lubricating motor oil produced from crude. It also presents findings from the Society of Automotive Engineers on rerefined oil quality and a 1995 ruling by the Federal Trade Commission on test procedures and labeling standards for rerefined oil.

Rerefined oil has to meet the same standards as virgin oil if the manufacturer is licensed by the American Petroleum Institute and displays the API donut symbol or the ILSAC starburst symbol. Rerefined oil products are subject to the same stringent refining, compounding, and performance standards that apply to virgin oil products. All API licensed oils, whether from rerefined or crude base stocks, must pass the same cold start and pumpability tests, rust and corrosion tests, engine wear tests, high temperature thickening tests, deposit tests and phosphorous tests.

Lubricating oils contain base stock and up to 20 percent additives to inhibit oxidation and degradation, improve viscosity, prevent foaming and provide fire retardation. Blenders use the rerefined base stock just as they do virgin base stock, with the same additive packages, when they prepare lubricating oils to meet specifications. Some common lubricating oils in the consumer market contain rerefined oil whether or not the label identifies it.

The information presented on the following pages is intended to demonstrate to fleet managers, automotive technicians and purchasing agents that rerefined lubricants that meet the same standards as virgin based lubricants have been recognized by API, SAE and the Federal Trade Commission as comparable in quality and performance. Activity at the federal government level and within trade and engineering associations is a significant contribution to the acceptance of rerefined lubricating products.

Fact:

Rerefined oil products are subject to the same stringent refining, compounding, and performance standards that apply to virgin oil products.

American Petroleum Institute certification

The American Petroleum Institute (API) establishes standards for engine oil quality.[4] API operates a voluntary licensing and certification program known as the Engine Oil Licensing and Certification System (EOLCS). EOLCS was developed by API to provide technical information on the performance and proper use of high quality engine oils. EOLCS licenses and certifies engine lubricants made from both crude oil and used oil that has been rerefined. EOLCS defines, classifies, certifies and monitors engine oil performance.

Two symbols - the API service symbol and the API certification mark - are the registered marks that identify motor oil products as licensed and certified oils. These symbols serve as a marketer's warranty that the motor oil complies with the licensing requirements.

EOLCS is based on a cooperative effort between the oil industry and vehicle and engine manufacturers represented by the American Automobile Manufacturers Association and the Engine Manufacturers Association. Performance requirements, testing methods and limits are established by vehicle and engine manufacturers and the International Lubricant Standardization and Approval Committee (ILSAC), the American Society for Testing and Materials, the Society of Automotive Engineers (SAE) and API.

Fact:
Less energy is required to produce a gallon of rerefined base stock than a gallon of base stock from crude oil.

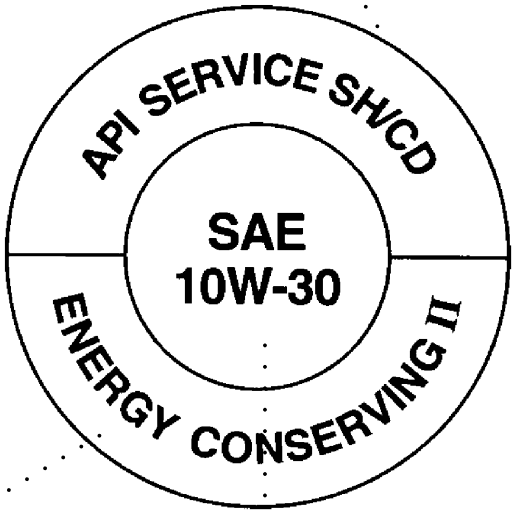
API certification process

To be certified by API and display the service symbol or the certification mark, a rerefined oil must pass a series of engine tests. Engine tests are run at different temperatures and operating conditions to determine the oil's ability to protect against rust and corrosion, wear, oil thickening and deposits and sludge. Additional tests are also run on engine parts or operation is simulated to show how the oil performs in a variety of driving and weather conditions. API also performs an after market audit to monitor the use of the license and the symbols it conveys. If a product is found to be out of specification, API implements a procedure to ensure that the marketer complies. By purchasing an API certified product, a consumer can be sure it meets standards regardless of whether it is manufactured from virgin or rerefined base stocks.

API service symbol

API's service symbol resembles a double circle and appears on the back of a bottle of motor oil. It designates the engine - whether gasoline or diesel - in which the oil should be used, describes the oil's characteristics and identifies its performance levels, or the conditions under which it should be used.

Designation is based on laboratory and engine tests that measure the oil's ability to control wear, sludge, varnish, oil thickening, rust, bearing corrosion and piston deposits.



Describes oil's performance category.

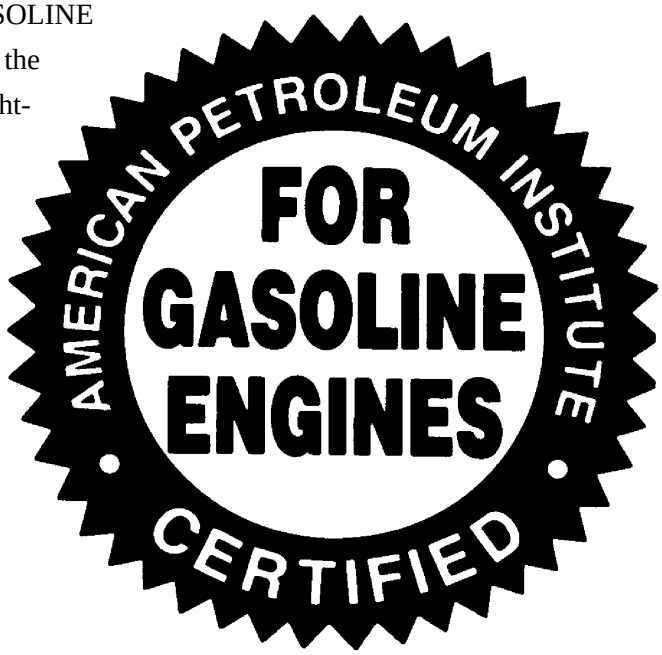
Oils labeled energy conserving have properties that can improve fuel economy. Energy Conserving II indicates that a laboratory test shows a 2.7 percent improvement in fuel economy compared to a standard reference oil.

Describes oil's viscosity - flow characteristics or thickness at a certain temperature.

- First number indicates low temperature viscosity, or how quickly an engine will start in winter and how well the oil will flow to lubricate critical engine parts at low temperature.
- Second number indicates high temperature viscosity, or an oil's ability to keep engine parts separated by an oil film at high temperature.
- W is for winter - appropriate for cold weather use.

API certification mark

The starburst identifies engine oils recommended for specified use, such as in gasoline engines. The top of the starburst carries the name of the American Petroleum Institute which administers the licensing system. The center of the starburst reads "FOR GASOLINE ENGINES." This identifies that the product is intended for use in light-duty gasoline engines. At the bottom of the starburst the word "CERTIFIED" means that the company selling the oil has confirmed that it meets all requirements and that the marketer has signed a formal licensing agreement with API and has been granted an API license to use the mark.



Fact:

65 percent of a gallon of used oil becomes a rerefined base stock. The remainder is used as an asphalt extender or as supplementary fuel.

Society of Automotive Engineers

Surface Vehicle Information report

The Society of Automotive Engineers (SAE) releases information reports on topics such as engine oil performance and engine service classification, engine oil viscosity classification and engine oil tests. In its *Surface Vehicle Information Report* (revised May 1996), the SAE discusses physical and chemical properties of new and used engine oils and rerefined lubricating products. The report discusses a range of processes used in the manufacturing of base stocks for engine oils, additive agents, physical and chemical properties, and tests pertinent to new and used oils. It is a general guide to engine oil properties and can be used as an outline for establishing oil quality inspection and maintenance programs.

In this report, rerefined base stocks are described as follows:

"Rerefined base stocks may be manufactured from used oil by rerefining processes. Rerefined stocks shall be substantially free from additives and contaminants introduced from the rerefining process or from previous use. Rerefined oil can undergo one or more of the following processes: water separation, additive separation, solvent extraction, hydrotreating and re-fractionation. The resulting finished rerefined oil is often virtually indistinguishable from good quality virgin base stocks. These rerefined oils may be suitable for use in modern engines when treated with appropriate additives."[5]

Fact:
Over 240 million gallons of used oil are improperly disposed of nationally each year -- equivalent to 24 Exxon Valdez spills.

Federal Trade Commission

Test procedures and labeling standards for recycled oil

The Federal Trade Commission (FTC) in accordance with Section 383 of the Energy Policy and Conservation Act of 1975 (EPCA), promulgated a rule prescribing test procedures and labeling standards for recycled oil.[6]

Effective November 30, 1995, the rule:

- ▲ defines recycled oil as processed used oil that the manufacturer has determined is substantially equivalent to new oil (produced from crude) for use as engine oil,
- ▲ adopts the test procedures for all engine lubricating oils identified in the American Petroleum Institute Engine Oil Licensing and Classification System (EOLCS) Publication 1509,
- ▲ determines that to demonstrate the substantial equivalency of recycled oil with new oil, manufacturers must use the EOLCS test procedures, and
- ▲ allows a manufacturer or other seller to represent, on a label on a container of processed used oil, that such oil is substantially equivalent to new oil for use if it can demonstrate that the recycled oil is substantially equivalent to new oil manufactured from crude.

Fact:
The Federal Trade Commission does not require that motor oil made from rerefined base stocks be labeled as either used or rerefined.

This rule does not require manufacturers to label a motor oil made from rerefined base stocks as either “used” or “rerefined.” However, in order for a manufacturer to claim, on a label, that the product is substantially equivalent to new oil, the manufacturer must base that claim on the oil meeting API standards.

VEHICLE WARRANTIES

Manufacturer warranties

A little known but critical fact about the use of rerefined oil is that it will not void a manufacturer's warranty provided the rerefined product meets the manufacturer's specifications and the vehicle is maintained at the recommended service intervals.

Federal law, known as the Magnusson-Moss Warranty Act, maintains that if an aftermarket motor oil (whether produced from a rerefined or virgin base stock) meets the performance level specified by the engine manufacturer, the manufacturer cannot prohibit its use and must honor their warranty, or provide a replacement product at no charge to the customer.

As a result, vehicle engine manufacturers do not prohibit the use of rerefined lubricants. They also do not approve or even suggest which brands of lubricating oils to use in their engines. Instead, manufacturers specify motor oils based on API performance standards. As long as the oil is licensed by API, displays either the starburst or donut symbol and meets the warranty requirements, the warranty must be honored. Warranty requirements are based on performance criteria, not the origin of the base oil.

A number of automobile manufacturers, including Chrysler, Ford, General Motors and Mercedes Benz as well as engine manufacturers such as Detroit Diesel, have developed statements related to the use of rerefined lubricants. These statements can be found on the following pages. Mercedes Benz has conducted studies to compare rerefined motor oils to virgin based oils using performance critical to engine life such as friction reduction, wear minimization and viscosity invariance. Mercedes Benz also installs rerefined oil in every new car manufactured in Germany. Mack Trucks has approved a number of rerefined lubricating oils for use in Mack engines.

Warranty statements, industry-wide use of the API licensing system and vehicle manufacturer evaluation of rerefined oil products have gone a long way in establishing the application and performance of rerefined lubricating products. In addition, there is no evidence that there have been any engine failures due to an API certified rerefined oil.

Fact:
Lubricating oil does not wear out, it just becomes dirty.

Chrysler Corporation

Position on rerefined engine oils

The engine oil used in Chrysler vehicles must meet the Owner's Manual recommendation to satisfy warranty requirements. This recommendation is to use an oil displaying the American Petroleum Institute Certification Mark (shown below). It must also be the SAE viscosity grade appropriate to the temperature, as shown in the Owner's Manual.

Oils that display this registered mark on the front of the container are certified to meet all the requirements of the International Lubricant Standardization and Approval Committee (ILSAC) GF-1 standard for engine oil. This specification does not differentiate between products made from virgin base oils or rerefined base oils. The marketer of the product must make sure that not only the initial product, but every batch of oil, meets the requirements of this specification.

Oils made from rerefined base oils can meet these requirements; however, not all of them do. By careful control of rerefining and blending processes, some marketers produce good quality oils from rerefined base oils. These are acceptable for use under the Chrysler New Vehicle Limited Warranty. Low or inconsistent quality oils may cause engine damage not covered by warranty.

Chrysler encourages the proper disposal and recycling of used oil to preserve natural resources and the quality of the environment. Recycling is encouraged by the purchase and use of these products.

9/95

General Motors

Position on use of rerefined engine oils

General Motors recommends for use in its vehicles engine oils which meet the performance requirements specified in the latest International Lubricant Standardization and Approval Committee (ILSAC) Minimum Performance Standard (currently ILSAC GF-1), and which are certified by the American Petroleum Institute for use in gasoline engines. Such oils may be identified in the marketplace by looking for the Certification Mark shown below on the front of the engine oil container.

Engine oils meeting these requirements can be made with either virgin or rerefined base oils. In both cases it is the oil marketer's responsibility to ensure that the product satisfies the performance requirements specified above both during initial product approval, and during the time that the product is being manufactured for sale. It is particularly important that steps be taken by marketers of engine oils made from rerefined base oils to ensure that variations in rerefining processes or raw materials do not adversely affect oil performance.

General Motors encourages the use of properly qualified rerefined products which consistently satisfy recommended performance requirements as a means of conserving vital petroleum resources. Use of rerefined products that have not been properly qualified or do not meet performance requirements, however, could result in engine damage, and could harm the reputation of all rerefined products. Engine damage caused by the use of an engine oil which does not meet the recommended performance specifications may not be covered by the General Motors new vehicle warranty.

Look for this Certification Mark

December 1, 1994

Ford Motor Co.

Position on engine oils made with rerefined base oils

Ford Motor Company does not specify the type of base oils to be used for engine oil meeting Ford's requirements. Regardless of the origin of the base oils, a non-Ford engine oil is acceptable for use if manufacturing and quality control practices ensure the oil continuously meets Ford's performance requirements.

Ford recommends using engine oil meeting Ford Specifications ESE-M2C153-E and licensed as CERTIFIED FOR GASOLINE ENGINES by the AMERICAN PETROLEUM INSTITUTE (API Certification). Both virgin and rerefined engine oils are capable of meeting these requirements by qualifying against a series of rigorous tests designed to ensure their suitability for modern gasoline engines. While these tests confirm a specific sample of the oil qualifies with acceptable performance, it is the responsibility of the oil marketers to ensure that their products meet the requirements consistently and continuously.

In general, vehicle operation, adjustments and maintenance procedures, such as oil changes, performed contrary to recommended manufacturer specifications may, but do not automatically, void the applicable warranty. Each warranty claim is reviewed on its own merits. If, however, the use of a non-Ford product causes or contributes to the failure of a Ford component, the cost of repairing the affected component is not covered by the Ford vehicle warranty. In such cases, the vehicle owner would have to look to the seller or installer of the non-Ford product for the replacement of the affected components and for any related damage to the vehicle.

Based on recent engine oil market surveys, Ford has concerns that some engine oils made with rerefined base oils may not consistently meet Ford's engine oil requirements. Test results show viscosity characteristics and low temperature performance of some engine oils made with rerefined base oils are unacceptable. However, there are other engine oils made with rerefined base oils which have met API Certification requirements and have met viscosity and low temperature characteristics.

Customers considering the use of engine oils made with rerefined base oils should be aware that the final product quality may vary if improper manufacturing controls are used. Marketers of engine oils made with rerefined base oils must adhere to standards for their base oils which ensure variations in rerefining processes or incoming raw materials do not adversely affect performance. In addition to a standard for the base oil properties, it is Ford's view that a rerefined oil produced with stringent manufacturing controls and batch to batch testing of low temperature viscosity performance and other significant characteristics would comply with Ford's recommendations.

September 9, 1994

Mercedes Benz

Position on Engine Oils Made with Rerefined Base Oils

In a letter to Evergreen Oil dated October 9, 1992, Mercedes Benz stated that for reasons of environmental protection and in order to save resources, they have been dealing with the use of rerefined oil for many years. The letter included the following statement:

"We have established that rerefined engine oils have the same performance as other engine oils. For this reason, rerefined engine oils are included in our lists of approved oils. That means from our point of view it is not important whether an engine oil consists of virgin base oil, synthetic oil or rerefined product. It has to meet our requirements. If these are fulfilled, then also rerefined products can be used. However, the producer is responsible for the constancy of quality."

Mercedes-Benz Aktiengesellschaft
October 9, 1992

Detroit Diesel

Position on engine oils made with rerefined base oils

DETROIT DIESEL CORPORATION

In a letter to the Community Environmental Council, the Detroit Diesel Corporation approved the following position on rerefined oil for use in this resource manual. This statement is supported by additional information Detroit Diesel has released related to the use of rerefined lubricants.

"Detroit Diesel, manufacturer of heavy-duty diesel and alternative fueled engines, permits the use of API-licensed rerefined oils, provided they meet SAE viscosity requirements. DDC is in favor of rerefined oils provided they are of high quality and produce a final engine oil which meets the API Performance classifications and SAE viscosity grades that DDC recommends."

Nancy J. Martin, Manager
Product Publicity

April 17, 1996

EVALUATING REREFINED OIL

Evaluating rerefined oil

State and local governments and private sector companies often evaluate rerefined lubricating products in pilot programs prior to switching an entire fleet to rerefined products. One of the benefits of conducting a pilot program is that it gives a fleet manager the opportunity to evaluate the performance of a rerefined oil in a few vehicles.

According to the U.S. Conference of Mayors, testing and field studies conducted by the National Bureau of Standards, the U.S. Army, the Department of Energy, the U.S. Postal Service and the Environmental Protection Agency have indicated that rerefined oil is equivalent to virgin oil, it can pass all prescribed tests and it occasionally outperforms virgin based oil.

This section profiles three examples of how different organizations previously or currently evaluate rerefined oil. The following pages include a discussion of:

- ✔ A two-year pilot program conducted by Caltrans
- ✔ U.S. Conference of Mayors Rerefined Oil Testing Initiative
- ✔ Unocal 76 Products sponsored Golden West Motor Sports race car

These examples illustrate that state and local government as well as the private sector have conducted successful performance evaluations of rerefined lubricants in a range of vehicles under various driving conditions.

In addition to the experiences of federal, state and local government agencies using rerefined lubricants, fleet managers and procurement agents can turn to information such as specification sheets supplied by oil manufacturers that identify the characteristics of the rerefined lubricating product. Spec sheets provide information on test methods and results for oil properties such as flash point, pour point, viscosity, and others. Spec sheets indicate the API service category, appropriate vehicle and engine application, and specific performance features.

Fact:

One gallon of used oil can pollute more than one million gallons of drinking water.

California Department of Transportation

From 1978 to 1980 the California Department of Transportation (Caltrans) conducted a successful evaluation of rerefined oil at two maintenance facilities, one in San Diego County and a second in Napa County.[7] In 1979 the agency included the Motorized Equipment Training Academy in San Luis Obispo in the pilot program. Caltrans tested rerefined lubricants on 108 vehicles including pick-ups, dumptrucks, loaders, graders and sweepers with both gasoline and diesel engines. These vehicles were representative of the Caltrans fleet at the time. The two maintenance facilities were located in areas that experienced severe service conditions due to terrain and wide temperature variations.

Caltrans contracted with two different rerefined oil suppliers and a testing laboratory to perform spectrochemical and physical property tests on the oil at specified intervals. The rerefined oil suppliers provided engine oil, transmission fluid, hydraulic oil grease and gear lubricant. Products were tested to ensure they met specifications before they were released for use.

"This research study has proved that rerefined petroleum products can be successfully used in fleet applications. . . The use of rerefined petroleum products should be encouraged wherever their use will result in energy, cost, or ecological advantages."

-- *Caltrans Rerefined Petroleum Products Evaluation*

During this pilot program, Caltrans found that the rerefined lubricants were performing well in Caltrans fleet application. Moreover, Caltrans did not experience any challenges to manufacturers warranties because both suppliers were required to furnish rerefined products that met State specifications. Initial field personnel reluctance was overcome once they found that the rerefined products performed similarly to new oil lubricants. The pilot program report states:

"There were no major problems encountered in this two-year research study on the use of rerefined petroleum products in the Caltrans fleet. Rerefined product quality was equal to conventional products."

Caltrans currently purchases rerefined lubricants from the 1996/98 Department of General Services (DGS) State Lubrication Oil Contract. Rerefined lubricants are used in Headquarters and all District offices. A table of the rerefined products that are available for purchase from the contract is located on page 34.

U.S. Conference of Mayors Buy Recycled Training Institute - Rerefined Oil Testing Initiative

The U.S. Conference of Mayors Buy Recycled Training Institute, in cooperation with Safety-Kleen, provides free cases of rerefined oil to cities and counties with populations over 30,000 to test in their fleets.[8] The purpose of the program is to encourage local government fleet managers to evaluate rerefined lubricants on their own, and to demonstrate that rerefined oil is of the same quality as virgin based oil. With one case of 12 one-quart bottles, a fleet manager can evaluate the performance of rerefined oil in one passenger vehicle over about three oil changes.

Unocal 76 Products Company

In 1995 Unocal 76 Products Company, with support from the California Integrated Waste Management Board, began using rerefined lubricants in a Golden West Motor Sports Pontiac race car. The car was raced during the 1995 NASCAR season and won the Southwest Tour Season championship. The successful performance of rerefined lubricants in a racing car engine indicates that rerefined products can function under extreme engine conditions.

"According to experts in the lubricating field, there is no reason that recycled lubricating oils cannot be satisfactorily used as basestocks for lubrication products. This was born out in the research on Caltrans fleet application of rerefined petroleum products."

-- *Caltrans Rerefined Petroleum Products Evaluation*

REREFINED OIL PROCUREMENT

Rerefined oil procurement

Rerefined lubricants are purchased by local and state government, the federal government, the United States Postal Service (USPS), private sector companies and the general public. Similar to virgin based lubricants, rerefined oil products can be purchased in bulk, 55-gallon drums, 5-gallon and 1-quart containers. Available in a number of grades, rerefined lubricants are used in a range of vehicles from passenger cars to heavy duty equipment such as loaders, graders, transfer trucks and others. Some cities purchase a 15W-40 multi-grade lubricant because of its application in a wide range of vehicles.

Local government

In California, a number of cities and counties purchase rerefined lubricants. The purchasing practices of the County of Alameda and the Cities of Sunnyvale, Santa Monica, Ventura, Burbank, and Thousand Oaks are included in this manual. The table on page 27 illustrates the grades, cost and container size of rerefined oil that are purchased.

State of California

The State of California has been a leader in the purchase of rerefined lubricants since the passage of SB 734, which became effective January 1, 1994. SB 734 requires state agencies to purchase rerefined products when they are of the same quality and not more than 5 percent more costly than virgin lubricants. On a biannual basis, the Department of General Services releases a bid document for lubricating oil and grease. The current contract, effective April 1, 1996 through March 31, 1998, includes four rerefined products, 10W-30, 15W-40, SAE 30 and SAE 40. See the table on page 34 for a list of these products and their cost.

Other states such as New York, Michigan and Nebraska have purchased rerefined engine oil in annual quantities of approximately 4,000 to 250,000 gallons and at a cost of $2.03 to $2.87 per gallon.[10] In 1993 Washington State embarked on a market development program that resulted in almost two dozen public agencies purchasing rerefined oil for use in public sector fleets.[11]

Fact:

Americans use more than 2 billion gallons of oil annually.

United States Postal Service (USPS)

The USPS has been purchasing rerefined lubricants since 1988. Unlike federal agencies that are required to purchase recycled products in accordance with Executive Order 12873, the USPS voluntarily purchases rerefined lubricants. In the first year of the program, rerefined oil was used in 14,511 vehicles and the USPS saved approximately 20 cents per gallon over virgin oil. In 1994 the program expanded to 105,600 vehicles and 500,000 gallons nationwide. Oil is purchased independently at the 335 vehicle maintenance facilities and therefore the price per gallon varies by location. Although the USPS does not have price preference in place for rerefined oil, there is a policy to purchase rerefined oil whenever the cost is within a few cents of virgin based oil per gallon. The USPS also uses a closed loop system to manage its used oil, collecting it for rerefining. This system currently saves the USPS up to 5 cents per gallon.

Federal government

The Defense Logistics Agency (DLA), a major supplier of lubrication products to federal agencies, awarded a contract for rerefined 10W-30 oil in early 1996. The 10W30 is available in boxes of 12 one-quart bottles, 5-gallon containers and 55-gallon drums. In 5-gallon containers and 55-gallon drums, the rerefined oil is available at a lower cost than virgin oil.[9]

Fact:

Similar to virgin lubricants, rerefined lubricating products can be purchased in bulk, 55-gallon, 5-gallon and one-quart containers.

10W-30	One quart cases	5-Gallon containers	55-Gallon drums
Rerefined	$14.99	$21.24	$181.27
Virgin	$11.89	$22.24	$184.92

Retail outlets

Retail outlets through out the country are beginning to stock rerefined lubricants, although the practice is not yet widespread. For example, WalMart stocks Safety-Kleen America's Choice and over 800 WalMart stores have quick lube facilities that on request will use America's Choice for an oil change. Trak Auto and Kragen Auto Supply as well as some 76 Products service stations stock quart containers of the 76 Products Firebird brand. Some ARCO am/pm service stations stock Lyondell Enviroil.

LOCAL GOVERNMENT PROCUREMENT OF REREFINED OIL

Jurisdiction	Grades	Gallons	Price	Preference Policy	Closed Loop
Alameda County (1)	10W-30 15W-40 Hydraulic 68 ATF	1,295 575 55 220	$3.08/gal $2.88/gal $2.49/gal $3.57/gal	Yes	Yes
Santa Monica (2)	15W-40	1,826	$1.49/gal $1.01/qt (3)	No	No
Sunnyvale (4)	15W-40	1,485	$2.55-2.77/gal	Yes/ Mandate	No
Ventura (5)	10W-30 10W-40	610 701	$3.60/gal $2.65/gal	No	No
Burbank (6)	15W-40	2,302	$2.62/gal	No	Yes
Thousand Oaks (7)	15W-40 ATF	1,200 N/A	$2.96/gal $3.28/gal	No	Yes

Notes:
(1) Fiscal Year 1995/1996. Lubricating oil is purchased in 55-gallon drums.
(2) Fiscal Year 1994/1995.
(3) Santa Monica purchased 1,316 gallons in bulk for an approximate cost of $880 (or $1.49/ gallon) and 510 gallons in quart bottles for an approximate cost of $2,060 (or $1.01/ quart).
(4) Fiscal Year 1994/1995.
(5) Oil purchased in 55-gallon drums.
(6) Oil purchased in 55-gallon drums.
(7) The City of Thousand Oaks began purchasing rerefined lubricants in July 1996 and purchases in bulk. The City also purchases 10W hydraulic fluid and 80/90W gear oil.

N/A = Not available.

Fact:
Rerefined motor oil is purchased by 335 U.S. Postal Service vehicle maintenance facilities nationwide.

DEPARTMENT OF GENERAL SERVICES
1996/98 Lubricating Oil and Grease Contract
Rerefined Products

55-GALLON BARRELS

Description	Brand		Price/gal*
Gas Diesel Engine Single-Viscosity SAE 30	Chevron	ECO HD 30	$3.57-3.66
Gas Diesel Engine Single-Viscosity SAE 30	Chevron	ECO 30W	$3.04
Gas Diesel Engine Single-Viscosity SAE 30	Unocal	Firebird 30	$3.00-3.23
Gas Diesel Engine Single-Viscosity SAE 40	Chevron	ECO HD 40	$3.57-3.66
Gas Diesel Engine Single-Viscosity SAE 40	Chevron	ECO 40W	$3.04
Gas Diesel Engine Single-Viscosity SAE 40	Unocal	Firebird 40	$3.00-3.38
Gas Engine Multi-Viscosity SAE 10W-30	Chevron	ECO 10W-30	$3.23-3.89
Gas Engine Multi-Viscosity SAE 10W-30	Unocal	Firebird 10W-30	$3.45-3.57
Gas Diesel Engine Multi-Viscosity SAE 15W-40	Chevron	ECO 15W-40	$3.07-3.41
Gas Diesel Engine Multi-Viscosity SAE 15W-40	Unocal	Firebird 15W-40	$3.10-3.15

Fact:
Used motor oil can be contaminated with PCBs, lead, arsenic, cadmium, chromium, and halogenated solvents.

ONE QUART/CASE OF 12

Description	Brand		Price/case*
Gas Engine Multi-Viscosity SAE 10W-30	Chevron	ECO 10W-30	$13.58-15.45
Gas Engine Multi-Viscosity SAE 10W-30	Unocal	Firebird 10W-30	$12.54-15.69
Gas Diesel Engine Multi-Viscosity SAE 15W-40	Chevron	ECO 15W-40	$12.63
Gas Diesel Engine Multi-Viscosity SAE 15W-40	Chevron	RPM 15W-40	$12.23
Gas Diesel Engine Multi-Viscosity SAE 15W-40	Unocal	Firebird 15W-40	$12.54-14.49

***** *Price ranges due to different district service areas.*

SELECT PRODUCTS
Percentage of Rerefined Base Stock*

SAE GRADE	Unocal	Rosemead	Lyondell	Safety-Kleen
10W-30	100%	100%	40%	100%
15W-40	100%	100%	40%	at least 50%
SAE 30	89%	91%	40%	100%
SAE 40	70%	63%	---	---
AW 32	100%	100%	40%	over 90%
AW 46	100%	100%	40%	over 90%
AW 68	58%	83%	40%	60%

* Percentage of rerefined base stock depends on individual blending formulas and viscosity of finished products. This table lists only a selection and is not an exhaustive list of the products available. Individual suppliers should be contacted for more inclusive information and specifications.

Fact:
Approximately 65 million gallons of rerefined oil are sold in the United States each year.

MANDATES, GUIDELINES AND RFP SPECIFICATIONS

Mandates, guidelines and RFP specifications

This section describes the California State mandate for the purchase of rerefined lubricants and the U.S. EPA procurement guideline for rerefined oil. It provides the relevant excerpts from the California Public Contract Code related to rerefined oil procurement, profiles a recent bid document released by the Department of General Services that specified rerefined lubricants, and discusses the approach taken by King County, Washington to specify rerefined lubricants.

Price preference

Although the California State mandate does not apply to local government agencies, it exemplifies how a local agency might consider implementing its own procurement policy. Some local governments, such as Alameda County and the City of Sunnyvale, have rerefined oil price preferences in place while others, such as the City of Thousand Oaks and the City of Santa Monica, do not. In these cases, either the rerefined product was the lowest bid or the purchasing agency decided to purchase rerefined products regardless of cost. A price preference is often set at no more than 5 to 10 percent over the lowest qualified virgin product cost. In another example, King County, Washington has a 10 percent price preference in place.

Closed loop

Another procurement strategy includes combining the collection of used oil for rerefining with the purchase of rerefined oil. Called closed loop or quasi-closed loop systems, a local government can develop one contract for the collection of used oil and purchase of rerefined oil. The used oil that is collected is rerefined. The U.S. Postal Service, Alameda County, the County of Ventura, City of San Jose and other jurisdictions have closed loop systems with the contracted waste oil hauler and rerefined oil distributor.

Fact:

No engine failures have been linked to the use of rerefined motor oils.

California Senate Bill 734

Senate Bill (SB) 734 (Rosenthal) which became law on January 1, 1994, mandates that the State of California purchase rerefined automotive lubricants, providing that these lubricant products are available in fitness and quality equal to that of their non-recycled counterparts, and are not more costly than 5 percent of the lowest vendor-quoted price for non-recycled products.

The State of California also requires recycled automotive lubricants, including but not limited to crank case oil, engine oil, transmission fluid, and power steering fluid, to contain a minimum of 70 percent rerefined oil to count toward the State's mandated goals or to qualify for the State price preference. The recommended minimum content standard refers only to the base oil fraction. It is based on the higher California 70 percent standard because products with 70 percent rerefined base oil are available on the West coast. Excerpts from the Public Contract Code related to the procurement of rerefined oil can be found on the following pages.

Fact:

If all Americans collected used oil for rerefining, it would keep 35 million cars running smoothly for a year.

U.S. Environmental Protection Agency guideline for purchasing rerefined lubricating oil

In 1988 the U.S. EPA issued a guideline for purchasing rerefined lubricating oils. The purpose of the guideline is to increase the use of rerefined lubricants by both the government and private sectors. The guideline requires all federal agencies and all state and local government agencies and contractors that use federal funds to purchase such products, to implement a preference program that favors the purchase of rerefined oil to the maximum extent practicable. The procurement guideline also states that procuring agents should not require lubricating oil containing rerefined oil to meet any performance standard higher than that required of virgin lubricating oils.

EPA recognizes API specifications as those that should be met by any oil, either from rerefined or virgin base stock. EPA recommends that procuring agencies set a minimum rerefined oil content standard of 25 percent of the base stock for purchasing engine lubricating oils, hydraulic fluids and gear oils.[12]

Public contract code related to rerefined oil procurement

ARTICLE 2.1 RECYCLED FLUIDS, PAINTS AND SOLVENTS

(Article 2.1 as added by SB 734 (Rosenthal), Stats. 1993, c.959)

12170. Fitness and quality being equal, all state agencies shall purchase the following products whenever available:

(a) Rerefined automotive lubricants, including, but not limited to, crank case oil, engine oil, transmission fluid, and power steering fluid, for all state vehicles, including but not limited to, all fleet cars, trucks, and buses, so long as the cost of the refined automotive lubricants are not more that 5 percent greater than the lowest price quoted by suppliers offering nonrecycled lubricant.

(e) "Fitness and quality" shall be defined in this section as meeting all specifications required of the product for its specific use including those of a manufacturer's warranty.

(g) "Rerefined motor oil" shall be defined in this section as having a neutral oil content consisting of at least 70 percent rerefined oil.

ARTICLE 4. RECYCLED MATERIALS, GOODS, AND SUPPLIES

(Article 4 as added by AB 4 (Eastin), Stats 1989, c. 1094)

12210. (a) Fitness and quality being equal, all local and state public agencies shall purchase recycled products instead of non-recycled products whenever available at no more that the total cost of non-recycled products. All local public agencies may give preference to the suppliers of recycled products. All local public agencies may determine the amount of this preference.

ARTICLE 7.6 RECYCLED OIL MARKETS

10409. Every local agency, as defined in Section 17518 of the Government Code, shall purchase lubricating oil and industrial oil from the seller whose oil product contains the greater percentage of recycled oil, if the availability, fitness, quality, and price of the recycled oil product is otherwise equal to, or better than, virgin oil products. This section shall not prohibit a local agency from purchasing virgin oil products for exclusive use in vehicles whose warranties expressly prohibit the use of products containing recycled oil.

Fact:

Rerefined oil has to meet the same standards as virgin oil if the manufacturer is licensed by the API and displays either the API donut or ILSAC starburst symbol.

Department of General Services specifications

On October 30, 1995 the State of California, Department of General Services (DGS), distributed an invitation to bid for lubricating oil and grease, for a two year period. The bid document required bids for four rerefined lubricating products and requested information from each bidder on the percent of base stock that was rerefined. Bidders were required to submit technical data sheets for all products offered with rerefined base oil. The final contract, awarded April 1, 1996, and effective through March 31, 1998, includes rerefined oil products. (See the table on page 34 for a list of the rerefined products on the state contract.)

The following excerpts from the document illustrate how DGS specifies rerefined lubricants in its contract bid document. This information can be useful for a local government agency developing a bid document for rerefined lubricating oil products.

DGS REQUIRED REREFINED OIL BIDS FOR THE FOLLOWING PRODUCTS:

- ✔ SAE 10W-30, 55-gallon drums
- ✔ SAE 10W-30, quarts
- ✔ SAE 15W-40, 55-gallon drums
- ✔ SAE 15W-40, quarts
- ✔ SAE 30, 55-gallon drums
- ✔ SAE 40, 55-gallon drums

In addition to requiring bids on the above rerefined products, DGS requested information on the percent of rerefined base stock in other products listed in the RFP.

Fact:

Waste oil feed used in rerefining is approximately 74 percent commercially generated, 14 percent from do-it yourself oil changers and 12 percent from agriculture government and industrial sources.

Rerefined product requirements

The bid document outlined the requirements of the State and participating local agencies for all desired commodities. The requirements for rerefined products were as follows:

- Items identified as "REREFINED" on the contract price sheets must be manufactured using at least 70 percent rerefined base oil. The finished product must meet all the requirements of the specification.

- Items not identified as "REREFINED" on the contract price sheets MAY be manufactured using rerefined base oil in any amount. However, to qualify for a 5 percent price preference, the product must have at least 70 percent rerefined base oil as defined in the Public Contract Code, Section 12170.

- If, before the expiration of the contract, additional rerefined products that meet the State specifications become available, the contractor may request to substitute such products. The contractor shall indicate in their request; item code, description, new product number and price.

- The State reserves the right to reject new product(s).

- If the State rejects the new product(s), notification to the contractor will be in writing. The contractor will continue to deliver the original product.

- If the State accepts the new product(s), notification to the Contractor will be in writing. However, delivery of the new product(s) shall not be before the date of the acceptance letter.

Fact:

About 100 gallons of crude makes 9 gallons of virgin base stock. 100 gallons of used oil makes about 65 gallons of rerefined base stock.

Lubricant specifications

Lubricant specifications listed in the bid document allowed the use of rerefined base stock as long as the finished product met all of the requirements of the specification.

Rerefined base stocks were included in the specifications for:

- ✔ 2-cycle and 4-cycle gasoline engine oils,
- ✔ multi-viscosity engine oil,
- ✔ cutting oil (soluble),
- ✔ thread cutting oil,
- ✔ lubricating oil for electric motors and generators,
- ✔ automatic transmission fluid,
- ✔ hydraulic transmission fluid,
- ✔ lubricating oil for steam turbines,
- ✔ air compressor oil,
- ✔ hydraulic oil,
- ✔ multipurpose gear lubricant, and
- ✔ hydraulic tractor fluid.

Fact:

Currently 85 percent of used oil that is recovered in the United States each year is burned for energy recovery.

Filing requirements

Pursuant to Section 12205(a)(1) of the Public Contract Code, bidders were required to complete a RECYCLED CONTENT CERTIFICATION FORM, whether or not the products offered contain any recycled content. See a reproduction of the form on the following page.

KING COUNTY, WASHINGTON
Supply contract for rerefined oil

In its 1992 invitation to bid for a rerefined lubricating oil contract, King County, Washington, outlined rerefined oil content specifications, reporting requirements, technical specifications and closed loop requirements.

Specifications

King County required a minimum 50 percent rerefined base stock in order to be considered rerefined. Under that definition, King County has a Recycled Product Procurement Policy (KCC 10.16), that provides a 10 percent price preference for rerefined oil and lubrication products. To qualify for price preference, bidders had to indicate any items offered as rerefined products.

Reporting requirement

The supplier is required to report the total dollar and unit volume of recycled and non-recycled oil and lubrication products supplied to each County department during each calendar quarter. This report is submitted to the Recycled Product Procurement Coordinator, Purchasing Agency, during the month following the end of the completed quarter.

Fact:
Retail outlets throughout the country are beginning to stock rerefined motor oils.

Technical specifications

All oil is required to have API certification and the vendor furnishes documentation of the certification upon request. Within each grade of oil, King County identifies the responding required API classification.

Closed loop

King County Contractor for used oil recycling services is required to collect used lubricating oil at designated King County facilities. An amount of used oil equal to the amount collected from County facilities has to be delivered to a rerefiner for use in the manufacture of rerefined lubricating oil.

ENDNOTES AND RESOURCES

Endnotes

1. Buy Recycled Campaign Rerefined Oil Publication, U.S. Conference of Mayors, 1620 Eye Street, NW, Washington, DC.
2. EnviroCom Consultants, Inc. *Affirmative Purchasing: Environmental Lubricants Re-Refined/Recycled*. 4175 E. La Palma Avenue, Suite 130, Anaheim, CA 92807, p. 11.
3. ibid., pp. 8-11.
   Gruber, William, "Evergreen Oil's Newark Re-refinery," EI Digest, November 1992, pp. 31-36.
4. Information on the American Petroleum Institute's testing and certification can be found in a pamphlet entitled, "Engine Oil Licensing and Certification System." It is available from API at 1220 L Street, NW, Washington, DC 20005, June 1995.
5. Society of Automotive Engineers, *Surface Vehicle Information Report,* 400 Commonwealth Drive, Warrendale, PA 15096-0001, Revised May 1996. p. 5.
6. Federal Register, Vol 60, No. 210, October 31, 1995, Part II Federal Trade Commission, 16 CFR 311 Test Procedures and Labeling Standards for Recycled Oil; Final Rule.
7. Additional information from the Caltrans study can be found in *Re-Refined Products Evaluation*, Final Report, Caltrans, Division of Equipment Maintenance and Development, P.O. Box 160048, Sacramento, CA 95816, December 1982.
8. For more information on the Rerefined Oil Testing Initiative, contact Jim Hoffman at Safety-Kleen, 800/525-5739.
9. For more information on re-refined oil available through the Defense Supply Center Richmond, contact Robin Champ at 800/345-6333.
10. Arner, Robert, Northern Virginia Planning District Commission, *BioCycle*, June 1994.
11. *Stimulating the Market for Rerefined Motor Oil: Findings and Recommendations from a Rerefined Oil Market Development Pilot Program,* Clean Washington Center, 2001 6th Avenue, Suite 2700, Seattle, WA 98121, June 1993.
12. For the full text of the EPA guideline, contact the CERI publications unit, 513/569-7562.

Resources

Much of the information that is found in this resource manual has been gathered and presented by a number of different organizations, government agencies and associations. The list below includes resources that were used throughout this guide.

Affirmative Purchasing: Environmental Lubricants Re-Refined/Recycled. EnviroCom Consultants, Inc., 4175 E. La Palma Avenue, Suite 130, Anaheim, CA 92807, 714/996-9956, 714/996-9959 (fax). Revised 1/27/95.

Buy Recycled Campaign, funded by the Office of Solid Waste, U.S. Environmental Protection Agency, conducted by the U.S. Conference of Mayors, 1620 Eye Street, NW, Washington, DC, 202/293-7330, 202/429-0422 (fax).

Buy Recycled Training Manual, 4th Edition, prepared by the Northeast Maryland Waste Disposal Authority, 25 S. Charles Street, Suite 2105, Baltimore, MD, 21201, 410/333-2730, 410/333-2721 (fax).

California Integrated Waste Management 1996 Statutes Report, Legislative and Regulatory Affairs Office, 8800 Cal Center Drive, Sacramento, CA 95825, 916/255- 2644.

Engine Oil Licensing and Certification System, American Petroleum Institute Publication 1509, 13th Edition, January 1995, 1220 L Street, NW, Washington, DC 20005, 202/682-8000.

Greening the Government: A Guide to Implementing Executive Order 12873, Office of the Federal Environmental Executive, Mail Code 1600, 401 M Street, SW, Washington, DC 20460, 202/260-1297, 202/401-9503 (fax).

Gruber, William, “Evergreen Oil's Newark Re-refinery,” EI Digest, November 1992, pp. 31-36.

Federal Register, Vol. 60, No. 83, Monday May 1, 1995, Part IV Environmental Protection Agency, Recovered Materials Advisory Notice.

Federal Register, Vol. 60, No. 83, Monday May 1, 1995, Part V Environmental Protection Agency, 40 CFR Part 247 Comprehensive Guideline for Procurement of Products Containing Recovered Materials; Final Rule.

Federal Register, Vol 60, No. 210, October 31, 1995, Part II Federal Trade Commission, 16 CFR 311 Test Procedures and Labeling Standards for Recycled Oil; Final Rule.

Re-Refined Products Evaluation, Final Report, Caltrans, Division of Equipment Maintenance and Development, P.O. Box 160048, Sacramento, CA 95816, December 1982.

Resourceful Purchasing: A Hands-On Buyers Manual with How-To-Do-It Guidance for Source Reduction and Recycled Products, by Nancy VandenBerg, Susan Kinsella & Associates and Lallatin & Associates, April 1996.

Stimulating the Market for Rerefined Motor Oil: Findings and Recommendations from a Rerefined Oil Market Development Pilot Program, Clean Washington Center, 2001 6th Avenue, Suite 2700, Seattle, WA 98121, June 1993.

S*urface Vehicle Information Report* (SAE J357), The Society of American Engineers, published by The Engineering Society for Advancing Mobility Land Sea Air and Space, International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, revised May 1996, 17 pages.